

3.0 RESEARCH DESIGN AND METHODOLOGY



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3.1 Research Design

The purpose of the Phase IB Archaeological Survey of the SR 1/ SR 9 Interchange project was to assess the presence or absence of potentially significant cultural resources within the project APE. In this effort, research aimed to determine: 1) the sedimentary / pedological sequences within the APE; 2) the range of historic and precontact-era activities that occurred within the APE and the broader project area; and 3) the presence and relative integrity of such deposits within the APE.

To achieve these determinations: 1) archaeological fieldwork was conducted within the APE; and 2) the cultural material from the excavations was processed and analyzed. A Phase IA Archaeological Survey of the project has already been completed and used to establish the testing methodology for the Phase IB effort for the project. As this document serves as a management summary, the results of the background research will not be detailed in the current document, except as it directly relates to identified archaeological resources. A synthesis of the area's history and archaeological past will be presented in the full Phase IB Archaeological Survey report. A future report will also provide a review of archaeological sites and archaeological studies in the project vicinity. The archaeological methods and results are discussed below.

3.2 Methodologies

The Phase IB Archaeological Survey included a controlled surface collection, and the excavation of shovel test pits (STPs) and test units. The archaeological survey focused on an assessment of the archaeological potential and content of project landforms. Methods were based in part on systematic reconstruction of the formation / depositional history of project landforms, by evaluation of the morphology and relative age of landform components, and by analysis of cultural materials recovered from these soil horizons. This study included assessments of general surface topography and internal stratigraphic characterizations of test exposures, including descriptions of sediment and soil characteristics.

For the purposes of this Management Summary, the excavation methodology for each section in the APE will be discussed separately.

3.2.1 Dover Air Force Base

The northern portion of the APE lies within the southeastern corner of the Dover Air Force Base. This area measures 33,186.97 square meters/ 3.31 hectares (357,221.6 sq ft/ 8.2 ac) and is bound by SR 1 and Kitts Hummock Road to the south, SR 9 to the east, and the project right-of-way limits to the north and northwest.

A 30.5 meters (100.0 ft) interval grid was imposed over the APE using the western-most right-of-way (ROW) stake as a datum point. From the datum, a transit was used to establish a 304.8 meters-long (1,000.0 ft) transect to the east, designated the N100 baseline. Test locations were set on the N100 line at every 30.5 meters (100.0 ft). At 274.3 meters (900.0 ft) east of the datum, a 243.8 meters-long (798.0 ft) transect was established perpendicular to the N100 baseline. Designated the E900 baseline, test locations were set on this transect at every 30.5 meters (100.0 ft). Using these two baselines, a grid of test locations was placed across the northern APE section at 30.5 meters (100.0 ft) intervals (Attachment A). All test locations were then given north and east coordinates appropriate for their location on the grid.

Shovel test pits (STPs) were excavated at each test location. Excavated STPs measured 0.5 meter (1.6 ft) in diameter. Soils were excavated by stratum and screened separately, with soil profile information, including soil texture and color, recorded on standardized forms. All soils were screened through 0.64-centimeters (0.25-in) wire screen to recover artifacts. All STPs were backfilled upon completion of each test, and STP locations plotted on a scale map of the APE. The APE and its surroundings were photographed during Phase I excavations.

3.2.2 SR 1, SR 9, and Kitts Hummock Road Intersection Infield

The central portion of the project area is defined by two triangular-shaped islands formed within the roadway intersection of SR 1, SR 9 and Kitts Hummock Road. The smaller

westernmost island parcel measures approximately 576.43 square meters (6,204.6 sq ft)/ 0.05 hectare (0.13 ac), and is grass covered. This area corresponds to the location of the proposed roadway overpass/bridge area. The eastern triangular island measures approximately 6,888.18 square meters (74,143.7 sq ft)/ 0.67 hectare (1.70 ac).

In the larger triangular parcel, a baseline was established 13.7 meters (45.0 ft) west of the edge of pavement of SR 9. STP 1 was placed on this transect 24.4 meters (80.0 ft) north of the edge of pavement of SR 1. STP 2 was placed 30.5 meters (100.0 ft) north of STP 1. From STP 2, a 91.4 meters-long (300.0 ft) perpendicular baseline was established towards the western end of the parcel. STPs 3, 4, and 5 were placed on this second baseline at 30.5 meters (100.0 ft) intervals. In the smaller triangular parcel, STP 6 was placed in the center of the lot, providing coverage for the proposed location of the overpass bridge.

The STP excavation methodology in the intersection infield follows the methodology as presented for the DAFB section above.

3.2.3 Tilcon Property

A controlled pedestrian surface collection was conducted of the Tilcon property in the APE located south and west of SR 1. The 30,662.41 sq. meters / 3.06 hectares (330,047.4 sq ft / 7.57 ac) APE is bound to the north and east by the inside (western) bend of SR 1, while the western and southern limits of the APE are defined by the right-of-way boundary for the proposed roadway design. At the time of the surface collection the field was planted in short grass measuring a few inches, the rows were planted approximately one foot apart, allowing sufficient visibility to conduct the survey. However, a small portion of the APE in the northwestern limits of the plowed field had been impacted by borrow pit excavations at the Tilcon sand and gravel quarry (Photograph 4).



Photograph 4: Area of Potential Effects (APE) in Tilcon property and impacts from adjacent borrow pit of excavations, view looking northwest (March 2004).

A 10.0 meters-interval (32.8 ft) collection grid was imposed in the APE with the aid of a transit. Using the southwestern-most right-of-way survey stake (found at the 45 degree turn in the right-of way line) as datum, a 150.0 meters-long (492.1 ft) baseline was laid out perpendicular to the southern right-of-way boundary line. Designated baseline "H", pin flags were set on the transect at 10.0 meters (32.8 ft) intervals. A second baseline, designated "1", was established using the southern right-of-way boundary line, with pin flags placed at 10.0 meters (32.8 ft) intervals. Using these two baselines, pin flags were placed across the remainder of the APE at 10.0 meters (32.8 ft) intervals (Attachment A). All blocks were then identified as an alpha-numeric designation (A-1, B-3) by their southwestern corner.

A.D. Marble staff collected the 10.0 meters (32.8 ft) square blocks at an interval of approximately every 1.0 meter (3.28 ft). All historic and prehistoric cultural material was collected by individual block provenience. The provenience of individual artifacts was plotted on grid sheets to further refine the materials location. The collection area extended from Column A east to Column GG (320.0 meters [1,050.0 ft]), and from Row 1 through Row 16 at the northernmost edge (160.0 meters [525.0 ft]) (Attachment A). Due to the curved edge of the northern and eastern portions of the survey area some collection blocks were fractions of a 10.0 meters (32.8 ft) square.

With the completion of the surface collection, four 1.0 meter by 1.0 meter (3.3 ft by 3.3 ft) test units were excavated in the southern section of the APE. In general, test units were placed within blocks which produced prehistoric ceramics during the surface collection. The purpose of these test units was to expose any potential cultural features found below the plowzone horizon and document the soil stratigraphy found in the Tilcon property. Test units were excavated in arbitrary 10.0 centimeters (3.9 in) levels within natural soil strata, with the plowzone horizon (Ap) removed as a single level. Each level was excavated and screened separately through 0.64-centimeter (0.25-in) mesh hardware cloth. All artifacts were retained regardless of cultural affiliation. All collected artifacts were removed to the A.D. Marble & Company laboratory in Conshohocken, Pennsylvania, for processing and analysis.

Information on soil characteristics and artifacts recovered from each test unit was recorded on standardized forms. Soil profiles were drawn to scale and photographs were taken to record representative unit walls. All profiles were drawn to scale utilizing standard soil descriptions and Munsell color nomenclature. Photographs were taken to document unit profile walls, features, and the general setting of the APE. Each test unit was backfilled upon completion of excavation and documentation.

Artifacts and faunal material were washed and labeled according to the *Interim Guidelines for Sampling and Curation of Archaeological Collections* issued by the DESHPO. All artifacts were cataloged into a computerized database. Historic artifacts were entered into the database and were categorized by functional group associations (e.g., Household Group, Architectural Group, Activities Group, etc.) following South's model (1977). Prehistoric artifacts were classified by lithic type: debitage (flakes and shatter), cores, tools, and cobble tools.